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THE

ADVOCATE OF SCIENCE,

AND

ANNALS OF NATURAL HISTORY.

VOL. I. PHILADELPHIA, AUGUST, 1834. No. 1.

WE take great pleasure in being able to present to our patrons and the public, the first number of the Advocate of Science in its new and improved form. The difficulty of procuring competent artists, to produce good engravings, has protracted the appearance of the work longer than was anticipated. This inconvenience is now overcome; and as neither expense nor labor have been spared in its execution; we flatter ourselves that the promise which has been made in these respects, is so far, fully redeemed. Of its contents, embracing a considerable variety, the public is left to judge. An intelligent and popular style having been observed in all the articles, this number may be regarded as a fair specimen of what the work will be.

An article on Geology together with an interesting essay on the method of drying plants, both intended as introductory to an elementary series on these highly interesting studies, have been necessarily excluded, till a future time.

We purpose to devote a few pages in each number to the proceedings of the different learned societies in the U. States. Our readers are referred to a very interesting summary of the proceedings of the Academy of Natural Sciences of Philadelphia, in the present journal.

Localities of rare and new plants, minerals, shells &c. will be also published from time to time. We hope our friends will not fail to supply us without further solicitation, with details of

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this kind; the information will prove of great service to the travelling naturalist.

There will also be furnished notices of works in the press; so that an opportunity may be given of knowing what advances are made in the art of *book making*.

We have before said, that critical notices on literary and scientific publications would be inserted. In doing this, it will be with the object of affording impartial views of the merits of such works, and not to encourage a disposition among any class of people to hurl the arrows of envious satire, against the productions of their neighbors.

We aver truth to be the object of our pursuit; and in seeking this, all unnecessary disputation shall be scrupulously avoided. For we well know the injury which science has sustained, by the imprudence of some of her votaries,—in many cases worthy men,—who give vent to those turbulent feelings which the philosophy of their study would modestly teach them to restrain.

The field for scientific labor and research is of sufficient amplitude for all who may engage in the cause. And we seldom see the honest disciple of truth swerve from "the even tenor of his way," to wrangle with his fellow laborers about an uncertain or insignificant point. For while he knows it is the imperative duty of a naturalist to correct error whenever he can, he is assured that none are justified in engendering strife among the members of a profession, whose duty consists in recording the history of the present, and in unveiling that of former revolutions of the world.

With favorable auspices, and a willingness to apply our humble abilities to the promotion of scientific knowledge, we hope our work will receive sufficient patronage to insure it a permanent existence.

BLACK TAILED OR MULE DEER.—CERVUS MACROTIS.

By Titian R. Peale.

Specific Character. Tail six to twelve inches in length, naked beneath, and with a black tuft at its extremity. Ears nearly the length of the head. Hoofs rounded.

Black tailed or Mule Deer. Lewis and Clarke.

Cervus *auritus.* Warden, 5, p. 640. French edit.

Cerf *mulet.*

Dain fauve à queue noire. Desmarest. p. 443.

Cervus *macrotis.* Say. Exped. to the Rocky Mountains. 2, p. 88.

Philad. Museum. No. 1493.

This animal occurs in the high, rocky, cedar hills in the vicinity of the Rocky Mountains, and is seldom, if ever seen in the prairies with the common deer (C. *Virginianus,*) though both species often associate in small herds among the hills.

It is larger, and from the goat like form of its hoofs is enabled to climb with greater ease among the high and naked rocks; its appearance when running is so different from that of the common deer that no hunter would ever confound them.

The view given in the accompanying cut, is an accurate representation of the country in which these animals are found; the grey sand-stone hills often appearing perfectly insulated, and nearly inaccessible on all sides, with their summits crowned by a stunted growth of cedars.

Dr. Richardson in his valuable work (Fauna Bor. Am.) observes "I have seen no authenticated specimens of the CERVUS *macrotis*, but the skins of male and female deer killed in the vicinity of the Rocky Mountains and presented to the Zoological Society, have all the characters given by Mr. Say to his species." Of one of these specimens he has given a figure and description under the name of C. *macrotis*. He appears to have been led into error from Mr. Say's having omitted some important peculiarities in his specific description, as the form of the tail and the great length of the ear; and hence it is not surprising that another species corresponding so nearly in size and other peculiarities, should have been mistaken for it.

The drawing and measurements now given were taken by myself, from a recently killed specimen; the same from which Mr. Say drew up his description, after the return of the expedition, when it was in a shrunk and mutilated condition. This drawing with many others were not published, from a want of that national encouragement, so strikingly exemplified in the manner in which Dr. Richardson's work has been issued.

We have adopted Mr. Say's name of *macrotis*, although that of *auritus* has priority, as his description was drawn up from the animal and not from the vague information of others. We are glad of an opportunity of protesting against this eagerness of naturalists, in grasping at every notice, however imperfect, in hopes of anticipating others and establishing their own acuteness. This procedure instead of advancing science, only tends to embarras and to retard its progress, by increasing a list of synonymes and fictitious species, already the bane of natural history.

Description. Rather larger than the common deer, having more the appearance of the Elk, destitute of the black marks on the lower jaw, near the angle of the mouth, which always exists in the *Virginianus.* Horns larger and more spreading but in general figure much the same; nose larger and more aquiline; lachrymal opening larger. Hoofs shorter, more rounded, and somewhat concave on their under surface as in the goats, and some antilopes; tail pale ferruginous above, destitute of hair beneath, and having a tuft of black hair, at its extremity. General color ferruginous above; lighter beneath; chin, throat, outside of the thighs and belly dirty white; eyelashes and whiskers black; iris dark brown, pupil blue black, horizontally linear; ears almost naked, blackish, externally lined with scattering white hairs.

DIMENSIONS.	Feet,	Inches.
Total length exclusive of tail,	5	"
Length of Tail,	0	7½
" Black tuft,	0	5½
" Hind foot,	1	6
" Fore leg to knee,	0	12½
" Lachrymal opening,	0	1
" Ear,	0	10
Breadth of Ear,	0	4
Height, top of shoulder to base of ear,	1	0
" of fore Shoulder,	3	0
" of Rump,	3	4
Girth round the Breast,	3	3
" the Body,	3	9

The above description was drawn up some years since, for publication in a periodical, which like many of our scientific journals in this country, came to a premature end; it was intended to correct the error in Dr. Richardson's valuable work, and though it is late now to offer it for the same purpose, it may still possess interest for some of your readers, and perhaps prevent others from committing a zoological mistake, from the want of precision in the publisher of the original account.

Philadelphia Museum, May 12th, 1834.

PHILOSOPHY OF BOTANY.—No 1.

DISSEMINATION OF SEEDS.

One of the most striking characteristics of the present liberal system of education, is the increased attention paid to the study of the various branches of natural history; and it is astonishing that mankind have for so long a period been in a state of apathy as respects the wonders which surround them, and so unmindful of their best interests, as to neglect or despise one of the sources of the purest pleasures they are capable of enjoying.

We do not now speak of studying the works of nature to the neglect of other occupations or duties, for, whatever may be the rewards allotted to those who devote their lives to the elucidation of her mysteries, it is not necessary in order to partake of their enjoyments, that we make the acquisition of such knowledge our chief end and aim. All that is required, is, simply to pay a moderate attention to the numerous objects of interest that surround us, and we may rest assured that every step of our inquiries will be attended with increased interest, will tend to ennoble our minds, and create in us higher conceptions of the power and wisdom of the great Creator of all things.

Among the interesting phenomena presented by the vegetable world, none is more deserving of attention than the modes provided by nature for the perpetuation and dissemination of the various races composing it; animals, from their higher endowments, and from their faculty of locomotion, are enabled to protect their offspring, and to seek such haunts as afford them proper shelter and necessary sustenance; in plants, however, to which sensation and the organs of spontaneous movement have been denied, other contrivances are requisite to effect this end.

One great source of the perpetuation of plants, arises from their astonishing fecundity; thus Ray states that he counted 32,000 seeds in one plant of the poppy, and 360,000 in a single specimen of the tobacco; yet these numbers, great as they appear, are insignificant in comparison to those furnished by an

examination of the seed vessels of the fern, or of the common puff ball, (*Lycoperdon.*)

Another reason exists in the great length of time required to destroy the germinating faculty of many seeds; for although a few species require to be planted soon after they arrive at perfection, the greater number preserve their integrity for an indefinite period. Mirbel states that he witnessed the growth of seeds taken from the herbarium of Tournefort, where they had remained for upwards of fifty years, and Fromo was successful in sowing barley that had been gathered one hundred and forty years previous. The most extraordinary instance, however, of the permanence of the germinating power is of very late occurrence, in which a bulb of a species of leek taken from the hand of an Egyptian mummy, vegetated, after having remained in a torpid state for thousands of years.

A further notice of these facts, however interesting and extraordinary they may appear, would lead me from the subject of my present communication, which is merely intended to draw the attention of your readers to some of the modes devised by nature for the dissemination of her vegetable treasures.

This purpose is accomplished by a variety of different expedients, which may be classed under the two divisions—spontaneous dissemination, and that effected by the aid of birds, quadrupeds and even man.

Spontaneous dissemination sometimes takes place from the great elasticity of the valves of the ripe capsule or seed vessel; this is well exemplified in the lady's slipper, (IMPATIENS *chinensis*,) and many other of our common garden plants; the most striking instance of it, however, is in the sand box tree (HURA *crepitans*) of the West Indies, the seed vessel of which when it has arrived at maturity, bursts with a considerable report, and scatters its contents to a great distance.

The seeds of other plants are so light, that they are carried by the currents of air to the most secluded situations. The common puff ball, (*Lycoperdon*,) when ripe, bursts at its summit, and pours out a stream of seed, which is so minute and in such quantities as to present the appearance of smoke; and the

imperceptible seeds of the lichens are disseminated in every direction, germinating on the surface of the most naked rocks and furnishing on their decay a mould for the reception of plants of a higher order.

In one of the largest natural classes of the vegetables, the Composite, the seeds are in general furnished with a tuft or feathery crown, giving them the appearance of small shuttle-cocks; by this provision they are rendered capable of being wafted by the wind to very great distances. Linnæus has even asserted that the Canadian fleabane, (ERIGERON *canadense*,) reached Europe (where it is now naturalized) in this way. Farmers have found from sad experience that very few plants of this class are sufficient to stock a whole neighborhood, and however assiduous they may be in eradicating these nuisances from their own fields, that all their labor is rendered nugatory by the supineness or negligence of a neighbor.

An apparatus of somewhat the same character is found in the *Asclepiadeæ*; in these plants, the seed is attached to the follicle by a silklike cord, which on the bursting of the capsule serves as a parachute to buoy the seed in the air, whilst in some species of Scabious, the dried and persistent calyx fulfils a similar purpose.

The heavier seeds of many trees are furnished with membranaceous projections answering the purpose of wings. In the elm and Ptelea this is circular, whilst in the ash it is lanceolate and terminal, and in the maple double, each seed being provided with a pair of these wing like appendages.

The dissemination of other seeds is effected by currents of water, the pericarp being so closed as to resist the effects of immersion. Thus the newly formed islands in the Pacific are planted with the cocoa nut and other trees by the action of the waves and currents: and it is said that a variety of West Indian seeds are cast on the shores of Ireland, Norway &c. in a state to vegetate, if the temperature of their climates permitted of it. In the water chinquepin, (NELUMBIUM *luteum*,) the receptacle separates in a spontaneous manner from its peduncle, and falling into the water, floats with the current to some distant

spot, where the seeds germinate and produce new localities for the plant.

Animals of all kinds have great agency in the wide dispersion of seeds, in a variety of modes. Thus, birds which feed on berries only digest the pulp, and void the stones in a fit state for germination. In this way the parasitic miseltoe spreads from tree to tree, and the same cause will account for the growth of so many of our forest trees, and more especially the cedar and wild cherry, along fence rows and in other similar situations. The Dutch at the time of their supremacy in the East Indies, in the hope of monopolising the trade in nutmegs, destroyed all the trees on such islands as they could not watch; their illiberal and covetous intention was, however, frustrated, as in a few years these islands were restocked with trees, springing from seeds brought thither by birds.

Horses and horned cattle also disseminate the seeds of various plants in the same way; for such as they swallow in an unbroken state often pass through them uninjured, and rapidly germinate. Many plants again are widely dispersed by adhering to the bodies of domestic animals; thus the goose grass, (*Galium*,) the burdock, (*Arctium*,) and many others, are provided with hook like appendages, which become entangled in their hair or wool, and are thus oftentimes carried to great distances. It has been stated with every appearance of probability, that the hound's tongue (*Cynoglossum officinale*) was unknown in many parts of the state of New York, until after the passage of flocks of sheep through them from districts where this plant abounded.

Squirrels and other animals that lay up winter stores of seeds, also aid greatly in the dissemination of the larger plants and trees; and in fact, we are in no small degree indebted to this source for the renovation of our forests. This is not the case, however, with ants, for although they likewise providently accumulate a stock of the smaller seeds as a winter provision, they destroy the germinating faculty of these grains, before depositing them in the earth.

Man himself unconsciously aids greatly in transporting the seeds of one climate or district to another, and some plants

may be said to follow the footsteps of Europeans wherever they go; this is no where more strikingly illustrated than in this country, where the plaintain, dandelion and many others have invariably accompanied emigrants from the shores of the Atlantic to the distant wilds of the west; and so numerous and completely naturalized have a multitude of foreign species become, that it is a task of no slight difficulty for the botanist to determine which are indigenous and which introduced.

It may indeed be safely asserted that mountains, rivers, and even the ocean itself, do not present insurmountable barriers to the dissemination or migration of seeds. The only true barrier to the universal dispersion of the different species of plants, is climate; however perfectly by care and attention we may in process of time succeed in naturalizing the denizens of a warm climate in temperate zones, no power that we possess can force the vegetables of the tropics to exist in an unprotected state when exposed to the low temperatures of the polar regions. Hence in the natural or artificial dissemination of seeds, it only takes place successfully to and from places situated in similar zones of climate. X.

NOTES OF A NATURALIST. By Jacob Green, M. D.

SAGACITY OF RATS AND MICE.

Almost every person has a *rat story* of his own. I can relate many marvellous instances in which rats and mice have displayed a sagacity scarcely inferior to that of the half reasoning elephant. Though a number of cases, in which their wonderful skill and contrivance in obtaining food, have fallen under my observation, they by no means equal some stories of the kind which I have received on the most *undoubted authority.* I shall confine myself, however, to my own experience. My thoughts have been turned to this subject in consequence of a little incident which happened lately. For a week or ten days past, I have been annoyed in my chamber by a most provoking mouse, who, the moment the light was extinguished,

regularly commenced his gambols. He would scratch and gnaw different articles of the furniture, run over my bed, and at last locating himself on my candlestick, would nibble away large portions of the tallow, and often produce such a clatter with the snuffers and extinguisher as to wake me from a sound sleep. I resorted to various contrivances and manœuvres to capture him. With the ordinary mouse trap he appeared perfectly familiar, so that he managed some how or other to pilfer all the bait with complete impunity. As he appeared so fond of my candle I made an arrangement with it, by which I was almost sure I should catch him. By means of a cord fastened above, I suspended the candle over a basin half filled with water, and then placed a board in a slanting direction from the table up to the edge of the basin, within about two inches of the candle. I expected that he would march up the inclined plane, and then by stretching forward to get at the bait it would plunge into the water. But no: the rogue, after a hearty meal, some how made his escape as usual. The next night the candle was suspended over the water, as I supposed, much beyond his reach, but in the morning I found it mutilated and eaten as before. When at college, I heard there,

> "That once a rat, for want of stairs,
> Came down a rope to go to prayers."

Could my little tormentor have descended the cord in like manner to take his supper? One morning I found the candle drawn from its perpendicular direction over the water and firmly fastened to the side of the basin near the inclined plane, so that the fellow must have made his customary meal in perfect security. After this I abandoned my contrivance and secured the thief with our approved, never failing, patent yankee trap.

To give another instance. I used to be fond of amusing myself with a turning lathe. The oil employed for the machine was kept for some time in an open cup, but as the mice rapidly consumed it, it was afterwards kept in a narrow necked bottle, hung up on the head of the lathe. Still every time when oil was wanted, the bottle was found empty. How did the mice contrive to remove all the oils, even to the very bottom of the

vial? The mystery was soon solved. The vermin introduced their long tails into the bottle, and thus drew out all the oil, as boys sometimes take molasses from a hogshead with a straw.

I could track the mice in the dust and fine shavings on the top of the lathe, by traces of oil made with their fore feet and tails.

An instance of the sagacity of rats which occurred in our family some time ago, surprised me very much. A score of eggs were deposited in an open box on the floor of a locked cellar; the sides of the box were about ten inches high, and the eggs just covered the bottom. In one night the rats managed to lift all the eggs over the sides of the box without breaking a single one, and if some shells had not been found at the mouth of their hole, no one would have suspected the thief.

Rats are sometimes exceedingly fierce and voracious. We once had a young kitten, nearly half grown, that would fearlessly attack almost any kind of vermin. One morning puss fell upon a large Norway rat, not far from his hole, and a terrible conflict ensued. The rat at last became victorious, and was dragging the poor screaming kitten by the throat to his den, when one of the family rescued it from his gripe.

The following anecdote would scarcely be credited if it were not related by the French physiologist Magendie, to whom it occurred. He went to one of the slaughter houses in Paris, where these vermin are exceedingly numerous, and enclosed twelve fine rats in a box, to use in his experiments. On his return home he examined the box and found but *three rats*, the other nine being devoured by the survivors, all but their tails and bones.

It is well known that rats are often very numerous and destructive on board of ships, and it is said that they have more knowledge and foresight as to the soundness and sailing trim of the vessel than the captain himself. Whenever they quit a ship, it is a sure sign that she is in a sinking condition. Their departure, I have no doubt, is owing to the leaks, and not to any foreknowledge. In crossing the Atlantic, I have sometimes heard the rats gnawing away at the timbers, but this did not trouble me much, as I knew that they never made holes en-

tirely throught the planks. It is, however, a popular mistake, that the rats have prescience of their destruction if they should thus scuttle a ship. Sea captains say that rats dislike very much salt water, and as the outside planks of a vessel are completely impregnated with salt, the rats gnaw until they taste the salt, and then desist.

It would be easy to relate many more particulars respecting rats and mice; the damage occasioned, and the total loss sustained, wherever they are numerous are immense, and well deserve the establishment of some regular system for their extermination.

OBSERVATIONS AND REMARKS ON THE AURORA BOREALIS.

By Henry Gibbons, M. D. Wilmington, Del.

Several years ago I observed that the appearance of an aurora borealis, was very frequently followed by an easterly storm, in the course of a few days; and also that on the day of the aurora, the wind is apt to be from the north. But I then adopted no positive method of testing the truth of the supposition, that some relation exists between our weather and that phenomenon. Latterly, however, I have prepared a set of tables, so as to compare the temperature, winds, rains &c. before and after an aurora borealis. The result though not quite confirmatory of my preconceived notions, exhibits some curious facts relating to this subject, which it is my design to set forth in this paper.

On inspecting my journal of the weather, in which the occurrence of an aurora is regularly noted, I find that this phenomenon has been observed fifty-two times, since the middle of the year 1827. In order to make the comparison between the weather which preceded, and that which followed these appearances, I drew up tables representing the state of the thermometer, barometer, wind, and weather, for each of the twelve days before and after them, and then found the average of the observations on the several days. This average or summary,

is presented in the annexed tables. Thus, in table 1, the first column shows the the average temperature of the day which preceded the auroras respectively (55° 67,) and immediately beneath, the average temperature of the day which followed them (52° 89.) The mean temperature of the days on which the auroras appeared is also given. So of the barometer in table 1, and of the wind &c. in the two succeeding tables. Table 4, exhibits the dates of the auroras, and the state of the weather on the same day, and also the phases of the moon at the time. The figures in the columns allotted to the moon, represent the number of days which intervened between the lunar changes and the subsequent auroras.

It is proper to mention that as the auroras were several times observed on consecutive nights, the last appearance has in such cases been exclusively regarded in preparing the three first tables; so that only forty-two periods are thus selected, instead of fifty-two, which is the whole number of days on which the phenomenon was observed.

I will now call the attention of the reader to a comparison of the temperature before and after the Aurora, as exhibited in table 1. The day before the aurora averaged nearly 56°, and the day after only 53°. Between the second day before and the second day after, there is a still greater difference, amounting to more than six degrees. The ninth day previous to the aurora is the coldest of the twelve; yet it is warmer than any of the twelve following days, excepting three. It is worthy of particular remark, and it is one of the most important facts to be deduced from the tables, that if we except the ninth day previous to the auroras, *no other day of the twelve is as cold as the warmest of the twelve subsequent days; and that the whole term of twelve days subsequent to the auroras, exhibits a lower temperature by three degrees than the prior term.*

The day on which the aurora occurs is colder than any one of the twelve preceding days, but warmer than most of the twelve following. Hence a remarkable decrease of temperature takes place at the time, or shortly before the time, of the aurora. This decrease of temperature continues, reaches its maximum on the sixth day, and is nearly five degrees below the

average temperature of the twelve days prior to the aurora. The sixth, seventh, eighth and ninth days after the aurora are much colder than any other four days of the twenty-five.

The indications of the barometer are unimportant, as no material difference is observed between the two periods. The general tendency of the barometer to rise as the thermometer falls, and vice versa, may however be traced in the table.

With regard to the course of the winds, it is evident, as might be expected from the decrease of temperature, that northerly winds are more frequent after than before the phenomenon. This change takes place precisely at the same time as the temperature falls, namely, on the day of the aurora. The greatest proportion of northerly winds in the previous twelve days is on the fifth before the aurora, when the wind was in that quarter on fifty-seven observations; but on the day of the aurora, there are no less than sixty-nine northerly observations. The wind is oftener at the north on the fifth and sixth consequent days, than on any other days of the twenty-five, excepting that of the aurora. As might be presumed, southerly winds are more frequent before than after the aurora.

As to cloudy weather and rain, there is no marked difference between the preceding and consequent periods. On the sixth day of the latter twelve, when it will be recollected the cold was at its maximum, less rain is noted, and also fewer days of rain, and with one exception less cloudy weather, than on any other day of the twenty-four. But a remarkable change takes place at that time; for the eighth day is the exact counterpart of the sixth, having more cloudy weather and more rain than any other day of the whole number.

The most prominent feature of the fourth table relates to the lunar phases under which the aurora appeared. This part of the table I did not imagine, before it was prepared, to be capable of furnishing any important deduction. But I confess that the result surprised me, though I am not prepared to explain it, or even to hazard a conjecture respecting it. More than half of the auroras, it will be seen, have occurred during the last quarter of the moon. There have probably been some appearances of the phenomenon during the other phases, unob-

served on account of the lunar light. But it is very eviden that this is not the sole cause of the result exhibited by th tables.

Having thus sketched in a hasty manner the results of my meteorological observations concerning the aurora borealis, I propose to advance something like a theory of the phenomenon in another paper.

TABLE I.

Showing the average state of the Thermometer and Barometer, before and after Forty-two Auroras, and also on the days of the Auroras.

		1	2	3	4	5	6	7	8	9	10	11	12	Mean
Therm.	before	55.67	58.68	55.83	55.38	56.23	56.05	55.33	55.31	53.40	54.69	55.68	55.48	55.39
"	after	52.89	52.38	53.77	53.53	52.55	50.88	51.15	52.14	51.55	52.38	52.90	53.38	52.46
"	day of													53.39
Barom.	before	29.76	29.77	29.82	29.78	29.72	29.78	29.87	29.86	29.85	29.78	29.74	29.77	29.79
"	after	29.82	29.82	29.83	29.77	29.78	29.84	29.86	29.76	29.75	29.81	29.80	29.79	29.80
"	day of													29.82

TABLE II.

Showing the proportion of Northerly, Easterly and Southerly Winds, before and after Forty-two Auroras, and also on the days of the Auroras.

		1	2	3	4	5	6	7	8	9	10	11	12	Mean
Northerly,	before	41	37	33	44	57	42	39	35	48	42	43	40	41.75
"	after	44	52	51	51	66	60	47	45	59	50	56	59	53.33
"	day of													69.00
Easterly,	before	37	41	54	32	20	26	48	36	38	40	37	30	36.17
"	after	43	42	39	28	24	34	49	51	36	31	22	13	34.33
"	day of													20.00
Southerly,	before	48	48	39	50	49	58	44	55	45	44	46	56	48.50
"	after	39	32	36	47	36	32	30	30	31	45	48	54	38.50
"	day of													37.00

TABLE III.

Showing the proportion of cloudy weather, the number of days on which rain fell, and the quantity of rain in inches, before and after Forty-two Auroras, and also on the days of the Auroras.

		1	2	3	4	5	6	7	8	9	10	11	12	Mean
Cloudy,	before	62	64	63	53	43	56	54	47	43	46	57	51	53.25
"	after	48	57	56	59	34	36	58	69	49	39	41	43	49.01
"	day of													22.00
Rainy,	before	16	14	13	11	12	12	12	8	7	10	13	14	12.00
"	after	9	14	14	11	5	4	11	16	11	7	8	8	10.00
"	day of													7.00
Quantity,	before	10.45	7.05	7.60	9.45	6.20	6.46	9.15	3.65	3.10	4.50	4.72	6.08	6.53
"	after	7.40	9.20	9.40	7.57	4.00	1.15	3.90	15.55	4.52	2.62	5.30	3.90	6.21
"	day of													4.40

TABLE IV.—Showing the state of the weather on Fifty-two days on which the Aurora Borealis has been observed, and also the phases of the moon at the time. Those marked with a star (*) imply that the aurora occurred on the evening of the moon's change.

			Therm. Sunrise,	Therm. Mid-day	Barom. Sunrise,	Barom. Mid-day	Wind. Morn'	Wind. P. M.	Wind. Ev'ning	Weather.	☽	○	☾	●
1	1827.	Aug. 28,	58	70	29.80	29.85	N	N	N	clear,	0	0	0	6
2	"	Sept. 8,	59	64	30.13	30.15	E	E	ENE	clear,	0	3	0	0
3	"	Sept. 9,	52	68	30.08	30·03	N	NE	E	clear,	0	4	0	0
4	"	Sept. 25,	47	73	29.75	29.63	NW	SW	SW	cloudy, clear,	0	0	0	5
5	"	Nov. 9,	45	51	29.43	29.52	NW	NW	NW	clear,	0	6	0	0
6	"	Nov. 18,	32	34	29.70	29.60	NW	NW	NW	mostly clear,	2	0	0	0
7	1828.	Jan. 18,	27	42	29.97	29.93	NW	SW	SW	clear,	0	0	0	3
8	"	Sept. 26,	53	63	29.75	29.85	NW	NW	NW	clear,	0	0	0	4
9	"	Sept. 27,	50	66	29.92	29.88	NW	NW	NW	clear,	0	9	0	0
10	1829.	Jan. 28,	25	31	29.70	29.75	NW	NW	NW	clear,	0	0	*	0
11	"	Mar. 18,	25	37	29.75	29.77	NW	NW	NW	cloudy, clear,	7	0	0	0
12	"	Dec. 19,	33	39	29.57	29.57	NW	W	NW	clear,	0	0	2	0
13	1830.	May 6,	59	67	29.75	29.74	SW	W	NW	clear,	7	0	0	0
14	"	May 14,	59	76	29.58	29.58	N	SW	W?	clear,	0	7	0	0
15	"	May 15,	59	75	29.66	29.68	NW	SW	W?	clear,	0	0	*	0
16	"	June 10,	63	73	29.52	29.66	W	W	W?	rain, clear,	0	4	0	0
17	"	June 11,	55	77	29.94	29.97	W	SE	SW	clear,	0	5	0	0
18	"	July 14,	66	82	29.84	29.85	W	SW	NW	clear,	0	0	2	0
19	"	Aug. 15,	67	85	29.81	29.67	S	SW	W	mostly cloudy, rain	0	0	5	0
20	"	Aug. 20,	66	81	29.95	29.91	NW	SE	NW	clear,	0	0	0	3
21	"	Sept. 12,	61	77	29.94	29.92	SE	S?	SW	cloudy, clear,	0	0	3	0
22	"	Sept. 15,	61	69	29.75	29.73	NW	NW	NW	clear,	0	0	6	0
23	"	Sept. 16,	52	65	29.86	29.88	NW	NW	NW	mostly cloudy,	0	0	0	*
24	"	Sept. 17,	46	60	29.95	29.96	NW	NW	NW	clear,	0	0	0	*
25	"	Oct. 9,	53	56	29.64	29.53	NE	NE	NW	rain, clear,	0	0	1	0
26	"	Dec. 11,	33	40	29.80	29.76	W	W	NW	mostly clear,	0	0	5	0
27	"	Dec. 12,	33	44	29.80	29.92	NW	NW	NW	clear,	0	0	6	0
28	1831.	Jan. 6,	25	37	30.02	30.04	NW	NW	NW	clear,	0	0	1	0
29	"	Jan. 7,	24	40	30.04	30.00	W	NW	NW	partly clear,	0	0	2	0
30	"	Feb. 6,	7	19	29.85	29.87	NW	NW	NW	clear,	0	0	2	0
31	"	Mar. 8,	29	45	29.85	29.87	W	W	SW	partly clear,	0	0	2	0
32	"	April 20,	51	70	29.65	29.55	W	W	W	clear,	2	0	0	0
33	"	May 8,	48	55	29.35	29.25	NE	NE	NE	rain, clear,	0	0	4	0
34	"	June 10,	64	80	29.98	29.93	S	SW	N	foggy, clear,	0	0	0	1
35	"	July 4,	69	82	30.09	30.06	E	SW	SW	clear,	0	0	2	0
36	"	July 5,	69	81	29.97	29.93	SW	SW	W	clear,	0	0	3	0
37	"	July 10,	57	75	29.82	29.90	N	N	NW	clear,	0	0	0	1
38	"	July 31,	70	86	29.91	29.90	SW	W	W	partly clear, rain,	0	0	*	0
39	"	Oct. 29,	36	53	30.15	30.16	NE	NE	NNE	clear,	0	0	2	0
40	1832.	Jan. 22,	24	31	30.11	30.13	NNE	NNE	NN	clear,	0	6	0	0
41	"	Mar. 27,	30	45	30.18	30.15	N	NW	W	clear,	0	0	4	0
42	"	Aug. 22,	63	78	29.78	29.75	W	W	W	partly clear,	0	0	4	0
43	"	Aug. 23,	64	78	29.73	29.75	NW	NW	NW	clear,	0	0	5	0
44	"	Sept. 30,	57	65	29.60	29.55	SW	W	NW	mostly cloudy, rain	0	0	0	7
45	"	Nov. 14,	37	42	29.72	29.76	NW	NW	NW	clear,	0	0	*	0
46	1833.	Jan. 2,	35	44	30.16	30.21	NE	NE	E	partly clear,	4	0	0	0
47	"	Mar. 21,	54	64	29.62	29.58	SW	SW	W	cloudy, clear,	0	0	0	1
48	"	May 17,	60	74	29.88	29.87	S	SW	SW	partly clear,	0	0	6	0
49	"	June 17,	60	77	29.72	29.71	NW	WNW	NE	clear,	0	0	0	*
50	"	July 10,	61	79	29.85	29.89	NE	S	E	clear,	0	0	1	0
51	"	Oct. 13,	48	60	29.29	29.65	NW	NW	NW	rain, clear,	0	0	0	1
52	"	Dec. 15,	26	32	30.16	30.06	N	NNW	N	snow, clear,	0	0	0	5

CLAIBORNE, ALABAMA.—By T. A Conrad.

From the Note Book of a Traveller.

To the student of natural science, or to the lovers in general of the glories of external nature, I know few places that can offer so many attractions as the village of Claiborne, which stands upon an extensive plain, elevated 200 feet above the Alabama, whose quiet waters are shaded by the noblest trees of a North American forest. From the landing place on the river you ascend by a winding road, having a wall of rocks on your left, and on your right a profound ravine, where in spring you may gaze down upon a wilderness of blossoms which decorate the humble plants, the more conspicuous shrubbery, or the giant trees; the air is loaded with incense, their grateful tribute to the zephyr, which fans their opening blooms. The umbrella tree here waves its enormous leaves, and expands its gigantic blossoms; and the *Magnolia grandiflora* spreads over its humbler relative a dark and glossy canopy of perennial foliage. As you reach the summit of the hill, you remark that it is fringed with low pines, many of which seem to spring from the solid rock, and to "twine their roots in perpendicular places." Fragments of the various strata skirt the margin of the river, and above, several springs gush from the surface of the calcareous rock, in which they carve their smooth and winding channels, and leap over the intervening chasms. From the elevated bank, you may gaze down on the wide spread alluvion of the opposite shore, and in the early days of autumn see it enveloped in a mantle of cotton, as white as the snows of the north; while the bare arms of the giant and girdled trees, still wearing their drapery of the graceful Tillandsia,* seem to bid defiance to the combined hostility of time and of man. In this region the Mistletoe springs from every oak, and in winter when the forest is denuded, supplies its parent tree with a compensating mass of dark green foliage, mingled and contrasted with its own delicate white waxen berries, and the bright green of the universal mantle of moss.

*The long moss well known as a material used extensively in place of hair for stuffing cushions, settees, &c.

If the houses of Claiborne are not remarkable for elegance, their defects at least are not prominent; for in summer they are buried in a mass of shade from the dense foliage of the China tree, whose elegance is of that unobtrusive but effective kind, which like the display of the gentler affections, sinks deep into the heart. The calm and quiet of the village is in keeping with the deep repose of the China tree, when the zephyr is sleeping beneath the influence of the sultry noon. Even the mocking bird is then silent, that most animated and untiring minstrel, the sweet Orpheus of the south, whose varied song is heard to greet the rising sun, not only on each morn of the vernal months, and amid the cool dews of summer and autumn, but even when earth is clothed in a chill and white mantle of frost.

Near Claiborne is a thicket the favorite haunt of this interesting and familiar bird, who flies from the gloom and loneliness of the forest, to enjoy the society and claim the protection of man, who is amply repaid by his love-taught melody and engaging and social manners. I envy not the human being who could in this sweet retirement, listen unmoved to the most eloquent of the forest minstrels, as he rapidly rehearses the musical lore which memory supplies, occasionally, by way of episode, telling his partner of his happiness and love, in his own native and more exquisite notes. For my part, I feel that my heart was ever so in unison with the glories and the language of nature, that a noble tree, an exquisite flower, or the song of a bird, could bring the tear to the eye, and soften the heart, making me for the time a "kinder and a better man," more forgiveing of injuries, and more merciful to the tribes of animated beings around me. Often when such feelings have existed in early youth, they are hardened by time and communion with the cold hearts of others, and the cares of traffic and gain; but how chilling must be the sensation when we discover that no form of external nature can arouse the dormant interest which formed the halo of our childhood; when the dew-moistened wing of the zephyr in vain bears the aroma of a thousand flowers; when the voices of birds seem a language strange to the ear, and are no longer consecrated by early recollections!

'Tis thus that the avenues to mercy have often been closed, an he who in youth was indulgent to the foibles of others, become an oppressor and a tyrant when fortune has granted him th power, which in proportion to its excess, leads him still furthe from the temple of Nature, whose priests are Justice, Merc and Truth.

Whilst pursuing my researches among the sylvan and vine clad cliffs and precipices, which constitute the beautiful scener of the Alabama river at Claiborne, I have often been visite by the Pewee flycatcher, with his simple but eloquent note Perching near me on the branch of a small tree, he views m with a degree of fearless curiosity, which would seem to inti mate that he recognized an old but half forgotten friend. Sweep ing from his perch in pursuit of the insects which sport aroun he describes a circle in his short flight, and returns to hi favorite tree. I fancied he was no stranger, but probably a individual to whose simple melody I had listened with no ordi nary pleasure, as I strolled along the romantic margin of th Schuylkill or Wissahickon, on the first fine days of the earl spring. I have ever admired the beautiful and appropriat name of *nunciola* or the messenger, applied by Wilson to thi familiar bird, who is of all others most truly the harbinger o the vernal season in the north, rejoicing in his return to hi native scenes, whilst yet the swallows are lingering in exile and the snow still remains in the unsunned ravines; whils those twin daughters of humility, the *Draba* and *Epigæa*, are perhaps the sole plants which gem the cold moist earth with their humble blooms, and the red flowering maple the only tree which ventures to put forth its blossoms in mockery of the storms which winter sends back in his angry retreat. Lone bird, thou bringest back to me the light and the glory of the joyous days of my childhood, and now that thou art fleeing like myself from the icy embrace of winter, thou seemest like a messenger of glad tidings, just come from my distant home, to visit with songs of rejoicing my solitary terrace on the rock. A few days past perchance, on the margin of the Schuylkill, thou wert listened to by some friend who little imagined that I should

ever give audience to the same winged minstrel on the banks of the Alabama.

Claiborne is a most interesting spot to the geologist. No where will he find in greater profusion those mute historians of the ancient revolutions of our globe, who seem as if by the wand of a magician to come forth from the eternity of the past. I am acquainted with no theory which satisfactorily accounts for the manner in which strata of organic remains like those of Claiborne have been deposited; but it seems evident that they have been forced up from the bottom of the sea. In the lowest deposit which contains various marine shells, we find so great a number of bivalves with the valves in their natural connexion, that we infer a more tranquil deposition than has taken place in either of the upper beds; the next in order of superposition is a soft limestone containing little else than oyster shells which seem to have been transported from a distance, as the valves are separated and appear to be water worn; but in the upper part they are more numerous, many are entire and they may probably have lived and died on the spot. But what is very remarkable, is, they became extinct before the other races of shells in the lower bed, which in fact reappeared and lived long after all the oysters had died; an incontestible proof of some vast and inexplicable change in the bed of the ocean, before and after the existence of a species of oyster, now imbedded in a soft limestone more than seventy feet in thickness. Nor is it less remarkable that the oyster, which generally lives in shallow bays and estuaries, should have above and beneath it, a class of shells peculiar to a deep or open sea. It would appear that after the deposition of the oceanic shells* an estuary had been formed, in which the oysters rapidly increased, as we find them scanty and small in the lower portion of the stratum, and large and very numerous in the upper. Another revolution or earthquake, has perhaps converted this estuary or bay, into the open sea, and a colony of shells very similar to the first has been brought from a distance by the very cause which destroyed the whole race of a certain kind of oysters.

* The term *oceanic* applies to those species which generally inhabit the open sea, and *estuary*, to those partial to bays, sounds, or estuaries of rivers.

But the relative proportion, of the different species reproduce is different; some kinds which were abundant at first, becam scarce on their second appearance; some grew far larger, an other species never attained the size of the original stock. Th oyster I speak of originated in the last of the secondary depo sits, but apparently only in those of South Carolina, as the do not occur in the same limestone in Alabama; it seems pro bable, therefore, that they have been transported from a dis tance, after the deposition of the last secondary bed in Ala bama, and that they gradually increased up to the time when they were entirely destroyed—when the oceanic shells reap peared, they were accompanied by a quartoze sand, in which they are now in perfect preservation; the disturbing force at the time of deposition, was merely sufficient to separate the valves of most of the bivalves and multivalves, without injury to the most delicate lines and angles; and one genus character ized by a very strong ligament in the larger species, we find almost invariably with a natural connexion of the valves, and even the cartilage remaining. Above this interesting stratum, some cause has originated sufficient to decompose nearly all the shells and zoophytes, and the carbonate of lime resulting from the decomposition, uniting with the clay and silex in which they were imbedded, has formed the whole mass into a rock, and the species are only traced by imperfect casts.

In reviewing the numerous and perfect fossils of Claiborne, and indeed of all the fossilliferous strata of our country, from the first of the cretaceous series, to the last elevated shore of the ancient sea, the conchologist is surprised to find no traces of fresh-water or land shells; and therefore no locality of testaceous fossils, hitherto discovered, has been formed in such a situation, as to have subjected it to the action of river currents, which shows how different from those of Europe, have been the circumstances which have influenced the formation of all the aqueous deposits of this country, from the era of the chalk to the latest tertiary beds. Here, all above the coal, appears to have been the bed of a vast uninterrupted ocean; and when the newer secondary strata successively emerged, the tertiary constituted a continuous portion of the bed of the sea,

from New Jersey to the Mexican Gulf. In all these revolutions no fresh water lakes appear to have been produced. In Europe on the contrary, repeated alternations of fresh water and marine species, exhibit the influence of local causes, without a parallel in this country, and afford incontestible evidence of the existence of lakes and rivers. As yet we can find no geological history of testaceous fresh water formations, but abundant proof in the newest of the tertiary deposits, that a chain of sounds, like those at present existing, washed the margin of a portion of the antediluvian continent. In these sounds we would expect the residuum of rivers to be abundantly deposited, if they were subjected to the action of powerful currents; but as we find no fresh water products among the estuary fossils, we are forced to conclude, that the tide even in that era, flowed a considerable distance from their mouths, up the various rivers, as at present.

THE TENT CATERPILLAR—CLISIOCAMPA NEUSTREA.

It is somewhat surprising that so little has been observed of the natural history of those animals which prove so hurtful to the labors of man. Every agriculturist knows the baneful influence which the curculio tribe of insects, the peach worm and caterpillar, together with many other small animals, exert on his granary and fruit trees; yet few take the pains of learning their habits, even so far as would direct them to measures for the prevention of the evils they inflict.

Every year do we hear some farmers complain of the ravages committed by the larva of the Curculio *granarius*, known by the name of weevil, among their grain. Others will tell how their plums are destroyed by the sting of another insect of the same family. Others again lament over the untimely death of their young peach trees by the worm, whose destructive course they are unable to stay. But more general than all, and more tantalizing, is the injury sustained from the lackey moth, or tent caterpillar. The present season has been remarkable for the

myriads which have appeared in this section of country. Every garden has been infested by them, and every orchard stript of its foliage to a greater or less extent. Not even the woods are exempt; for in many cases whole acres of white oak (QUERCUS *alba*) have been so completely ravaged, that it seemed as though the genial warmth of spring had been insufficient to recal them from the torpor of the winter months.

This moth lays its eggs near the extremities of small branches of trees. The manner in which she proceeds in this operation, has not been witnessed by any naturalist, so far as is known; and though Reaumur reared a great number for the purpose of ascertaining, yet his efforts proved unsuccessful. They have somewhat the shape of a wine glass, the upper ends being larger than the lower, and placed round the branch in the form of a ring: thus, like the stones of an arch are they disposed, and firmly united together by a kind of glue, so that they are admirably adapted both to secure their adhesion to the branch, and to protect themselves from all accidents and inclemencies of the weather. For it is with difficulty they can be crushed, "even when they are slipped off the branch, round which they are set like pearls on a bracelet, which is the name given them by the French peasantry." The cement is also very hard, and according to Swammerdan is insoluble in water, the heaviest rain dashing upon them without doing injury.

In this state they pass the winter, and about the beginning of May, the caterpillar is hatched. For the first day or two after their birth, the colony quarters itself on the end of the twig, which supplies them with young and tender leaves for food. Afterwards they descend the branch in a body till a good crotch is met with, where they immediately begin to weave their nests, similar in shape to a tent; hence the name of the animal, tent caterpillar. As they grow larger and require more room, successive layers of the web are spun over the original one, in the same manner as the bee builds the different ranges of its comb; passages or doorways being preserved to the different apartments.

Toward evening or early in the morning, they go forth in

procession to feed; and their direction over the tree is influenced in part by the course of the wind. All pursue the same course as the leaders, and what is one of the most curious traits in their character, each worm leaves in its track a web, which serves as a turnpike on which the whole regiment travels, during both its progress and return. If this turnpike be destroyed in any one place, by rubbing a finger across it or otherwise, great consternation is produced. The leaders halt, and the whole mass is stopped, till some one possessed of superior enterprise and courage, makes a bold push, and succeeds in passing the chasm. The thread which he leaves behind is a guide for the others; and as the march is now resumed, the breach is soon mended by the strands, which increase in number as the body advances.

The formation of this web exhibits an interesting feature in the history of our subject. The substance composing it is a secretion formed from the food of the animal, which it is obliged to evacuate; and nature has given it that disposition, so characteristic of the economy observed in all creation. For while almost continually employed in spinning, the caterpillar is unconsciously securing itself from the dangers and inconveniences incident to its life. In the nest it is employed in enlarging its domicile, to suit the convenience of the growing community. The turnpike it makes along the branches of the tree, serves both to conduct them home, and to show them on future occasions on what parts they have fed, so that the same locality need not be visited several times. If it should lose its foothold and fall to the ground, the web which accompanies serves as a ladder by which its former situation is regained. And in the ultimate period of its life as a worm, this glutinous substance is the material which forms the coccoon, from which it emerges a new being, destined to show abroad the benevolence of nature, and the splendor of her designs.

In the successive stages of their existence, caterpillars cast their skin, or moult, four times. The process by which this is accomplished is detailed by Reaumur, and is very interesting. The superfluous nourishment, of which it receives a considerable quantity, lies between the successive skins, in the same

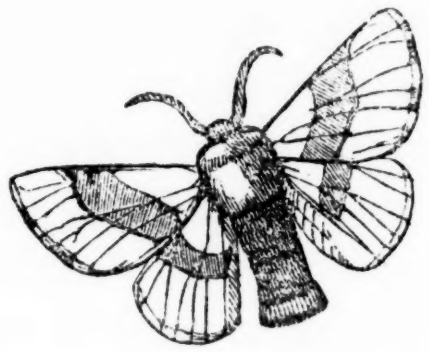
way as the adhesive gluten is disposed in leaf buds. As th first inner skin increases in consistency, the fat which lies be tween it and the outer one, appears to be absorbed by the bod of the caterpillar, which of course enlarges; while its abstra tion from the outer skin renders this much more dry, separate it from the inner one, and disposes it to harden and shrivel.

The absorption of this fat also produces the remarkable co sequence of gorging all the channels of nutrition, so that ther is no longer any demand for fresh supplies of food. The ca terpillar accordingly ceases to eat, and having no incentive t action, remains almost motionless. Meantime, the outer ski becoming harder and shrinking more and more, and the inne one enlarging, the two opposing powers produce a struggl which is soon brought to a termination: for the caterpillar be coming impatient of the pressure, begins to turn and twist it self in various directions, in order to be rid of the inconve nience. At length it succeeds in rending the skin at its weak est part, which is usually on the back just behind the head; an in a few minutes it may be seen issuing through the breach using its body as a wedge. It now assumes a new dress, th tints of which are brighter than the former. It will not b amiss to notice one interesting fact in relation to their moul ing. The hairs of the old skin are not, as might be supposed tubes, which serve as the receptacles of the new hairs previou to moulting. But the new hairs are lapped close to the bod of the insect at this time, and there is no connexion whateve between them and the old ones. After having passed throug the ordeal of moulting, the activity of the worm returns, an it may be seen in its enlarged and new dress, busily engaged i its former avocation, until its size increases so as to be again to large for its outer skin. The same sluggish disposition and th same abstinence again return, and the process of change is re peated which has just been described.

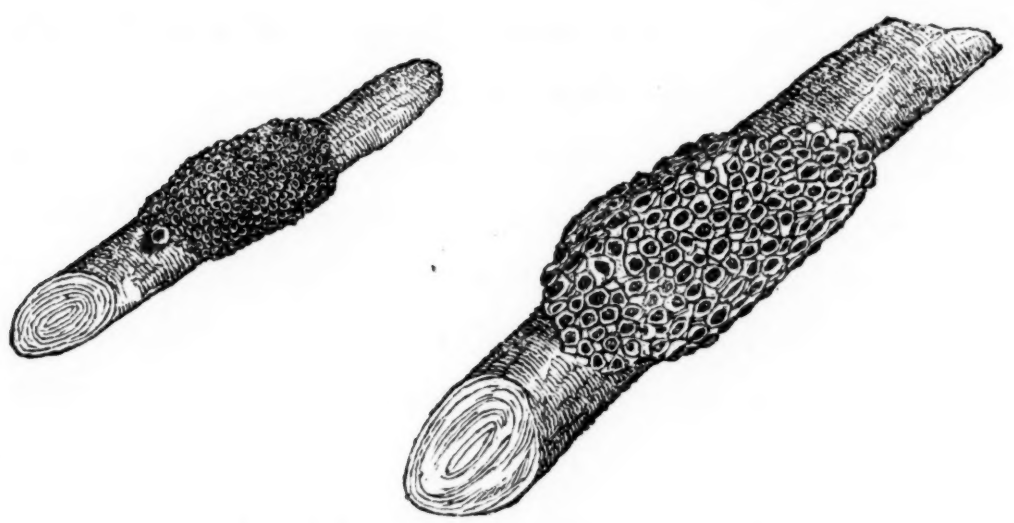
This account of the process of casting the skin is confirme by the dissections of Swammerdam and several other natu ralists.

The tent caterpillars are gregarious until after they moul the fourth time. Their community is then broken up; eac

one choosing for itself a suitable place, which is generally on a leaf, where it commences spinning its coccoon, by drawing the edges together so as to form a kind of shed which protects it both from its enemies and the inclemencies of the weather. In the course of a week or ten days, it emerges from the coccoon, a beautiful moth with a dark band across each wing, of which the annexed figure will give some idea.



The manner in which the moth deposits her eggs has already been described; and a further explanation is given in the engraving, of which the smaller figure represents a nest of eggs of the natural size, and the larger, one of magnified dimensions.



This operation is performed about the middle of June, each moth laying from 200 to 500 or more eggs. They may be very easily seen near the tips of branches after the leaves have fallen from the tree; and this is the auspicious period at which the whole generation of the coming spring may be totally destroyed with but little trouble, by going over an orchard, cutting off the twigs which have the eggs on, and disposing of them as fancy may suggest. For it is to be remembered that caterpillars are not migrating animals. They are hatched and spend the predatory portion of their life in the same locality. Hence if the eggs are carefully removed from a tree during the fall or winter,

we may be certain that there will be no caterpillars on it t ensuing spring. This method of exterminating them is decide ly better than that practised by many agriculturists, of borin into the tree with an augur, and filling the cavity with sulphu since the tree sustains no injury by it: whereas the practice boring into the wood subjects it to premature decay. In add tion to this it is a doubtful remedy.

On further investigation it will probably be found that thes caterpillars confine themselves to a certain district of countr at a time. Thus we were informed they have extended t the north during the present summer, but a few miles abov Haddonfield. Their southern and western limits are yet unknow The immense numbers which appear in some seasons, and thei comparative scarcity in others, seems to be partially accounte for by Mr. Salsbury an English gentleman. One of his acquaint tances informed him that he took a nest of moths and bred them Some of the eggs fecundated the first year, some the second and some did not hatch till the third season. Subsequent expe riments, however, of the same kind, did not substantiate th generality of this phenomenon.

For many interesting particulars in this little essay I am in debted to our persevering friend and naturalist Titian R. Peale whose labors in entomology as well as in other branches o science, entitle him to a merit and confidence, commensurate with the happy success which has attended his researches.

W. P. G.

SOME ACCOUNT OF THE CICADA SEPTENDECIM, OR PERIODICAL LOCUST.

By Henry Gibbons, M. D., of Wilmington, Del.

In preparing a brief history of this singular insect, I shall use, in addition to my own observations, the following publications on the subject:

Rees' Cyclopædia, Art. *Locust, Cicada, Gryllus.*

Barton's Medical and Physical Journal.

Encyclopædia Americana, Art. *Locust.*

Address to the Del. Acad. of Nat. Science, by Wm. Gibbons, M. D.

The locust, grasshopper, katydid, cricket and several analogous tribes of insects, were grouped together by Linnæus in a single genus, which he named GRYLLUS. This very extensive genus has been divided by later naturalists into a number of genera, one of which is the CICADA, consisting of the locust family, characterized by legs adapted for creeping or climbing, a proboscis to bore into trees and suck the juices, and a peculiar noise emitted by the males. The CICADA *septendecim* is the most remarkable species of the genus. Its specific name is derived from the circumstance of its periodical appearance at intervals of seventeen years.

The periodical locust is not found in the old world, but occurs in great abundance in many parts of the United States. The climate of New England appears to be too cold for this insect, as I cannot learn that it has very extensively appeared there nor in the northern part of the state of New York. The description of it given by Linnæus was obtained from a Swedish naturalist, who visited America many years ago. Linnæus himself never saw the animal. It is essentially different from the Egyptian or migratory locust, which is more properly a grasshopper, having legs adapted for jumping, and jaws for devouring solid substances. I will draw up some account of this celebrated and destructive insect in another paper.

It is a subject of reproach to American naturalists that they have not investigated more fully the history of a creature so curious and interesting as the CICADA *septendecim*. The only apology for such neglect will be found in the remoteness of the periods of its visitation, and its transitory existence in the winged state. That it mostly emerges from the ground at regular intervals of seventeen years, there can be no question. The year of its appearance, however, varies in different sections of country. In 1792, according to Barton, it visited the neighborhood of Elizabethtown, New Jersey, and had certainly appeared there three times before, at regular intervals of seventeen years. In 1797 it appeared in some parts of the state of New York. In 1800 it visited most of the middle and

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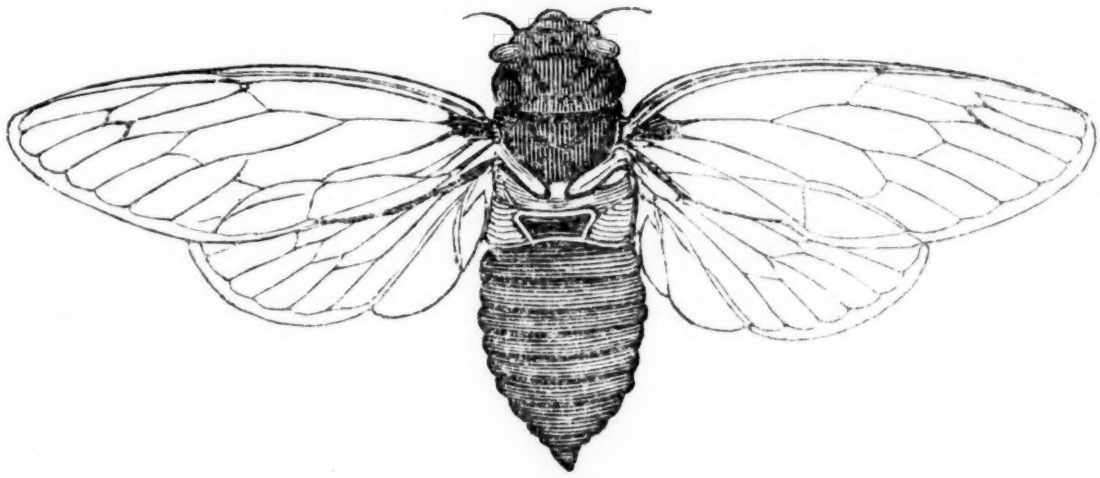
southern states, and it is known to have observed the period of seventeen years in this extensive section of country, both before and since that time. In the middle and western portion of the state of North Carolina, it appeared in 1803. The probability is, that nearly every year is the "locust year" in some portion or other of our country. I have adopted measures for the purpose of ascertaining this fact, and will publish the results of my inquiries at a future time.

The duration of the subterranean life of the periodic locust may therefore be fairly estimated at seventeen years; or in other words, the insect requires that length of time to elapse after descending into the ground, before it is prepared to assume the winged and mature form. In this respect it resembles many other insects which also require a definite period of time to undergo their several transformations. The caterpillar, for instance, retains the worm form a certain time, and then wraps itself in a cocoon for another limited period, until ready to come forth in its perfect state, a butterfly. It is more than probable that a combination of peculiar circumstances may either shorten or prolong for a year the term which the locust usually requires to pass through its several stages of development. If the term of its life could be thus either shortened or prolonged for a single year, it is evident that the family would be ultimately divided into a number of colonies which would emerge from the earth in different years, as we observe to be the case.

The general habits of the insects in question may be stated in a few words. They come out of the earth in the spring, or early in the summer, in the *chrysalis* or *pupa* state, of the form and size represented by the accompanying figure. Instinct leads them immediately to seek an object on which to climb, as a tree, fence, or even a blade of grass. Here they take a firm hold with their feet, burst their shell, and emerge from it a winged insect, adapted for an ærial life. The rites of Venus being performed, the female then deposits her eggs in a wound which she makes on the tender twigs of trees by means of an instrument designed for that purpose. Having thus provided for the continuance of their race, and accomplished the object

of their ascent and transformation, all the individuals of the parent stock die of old age, after a merry life above ground of a month or six weeks. The twigs in which the eggs are inserted soon die of the wounds inflicted by the female in forming her nidus, and being broken off by the wind, fall to the ground, conveying with them the collection of eggs, or the newly hatched insects. Here, the hatching of the eggs is completed, and the whole family immediately enters the earth. For seventeen years they remain in the soil, growing in magnitude, and advancing towards maturity. At the expiration of this time, the same animal which was once impelled by instinct to burrow in the earth, is driven by another instinctive impulse to leave its dark abode and rise into the air, to assume the perfect and mature form as here figured.



The precise time when these insects emerge from the earth varies with the climate and the latitude. As the weather becomes warm, they may be found just beneath the surface of soil, awaiting the arrival of a day favorable for their ascent. They have bored their way upwards far enough to enable them to reconnoitre the state of things above ground; and when they find suitable weather, they have nothing to do but to throw off the slight covering that remains on the aperture of their subterranean abode, and march forth into the element in which their existence began many years before. About an hour before sunset provided the weather be warm, they begin to issue from their dwellings; and they continue to ascend until after sunrise in the morning. In the year 1817, they were first discovered in the neighborhood of Wilmington, about the middle of the Fifth month, but it was not until the 25th of the month

that they came out in any considerable number. In the pr
sent year a few of them were found in a situation very favo
able to their early appearance on the 7th of the same mont
Their operations were suspended, however, by the cold weath
which ensued, and about the 15th they were again invited for
by a warm atmosphere. From this time till the 8th of th
Sixth month, they continued to emerge in one place or anothe
as the weather permitted. I found one which had just risen fro
the earth so late as the 15th. It is worthy of remark that i
the present year the period of their ascent from the earth wa
prolonged for nearly six weeks, and that for two weeks at lea
of this time the number which appeared on any one day wa
not perceptibly greater than on any other. On the other han
we observe that in 1817 the principal portion of the tribe mad
their appearance on a single day—the 25th of the Fifth mont
This difference may be ascribed principally to the weather.*

The chrysalis of the locust on leaving the earth is about a
large as the humble bee divested of its wings. Its color is
dirty yellowish brown, with a dark spot on each side of th
thorax, as represented in the cut.

The insect must now prepare itself for its ærial life, b
throwing off its covering or shell, and assuming the winge
state. Immediately therefore, it creeps on the ground until i
meets with a tree, shrub or some other elevated object, o
which it climbs. Having selected a suitable spot, it takes
firm hold with its feet and becomes completely motionless
The distance which it travels before coming to a stand, varie
from two or three feet to as many yards; and I have seen th
shells on trees twenty or thirty feet from the ground.

* In the Encyclopædia Americana, they are said to emerge from the groun
"about the latter end of April." This is too early. In North Carolina, accord
ing to Dr. Jones, in Barton's Journal, they did not appear in 1803 till early i
May; and in Delaware, as I have already mentioned, they do not appear till th
latter end of May.

Whether they are directed to a suitable object by the sense of sight or some other faculty, or whether the discovery of such an object is merely accidental, I am not prepared to say. On two occasions I saw them coming up near a large tree, and in both cases much the greater number were crawling towards the trunk of the tree. That they can exercise the sense of vision to a small extent in the chrysalis state, I assured myself beyond a doubt.

In order to facilitate its future operations, the chrysalis uniformly assumes a depending position. If on the trunk of a tree, its head is upward, and if on a branch, it clings to the lower side. The design to be accomplished by this will be evident in the sequel.

The process by which the locust extricates itself from its shell is very curious. After fixing itself as before stated, and remaining completely motionless for five or ten minutes, the shell is seen to split lengthwise on the posterior part of the chest, and the fissure slowly extends to the length of half an inch or a little more. The back of the animal which is thus exposed to view, may be observed to move frequently by twitches, or sudden contractions of the muscles of the thorax, the visible effect of which is to draw the head and abdomen toward each other, and to protrude the back through the longitudinal cleft. By the same motion, the legs, antennæ and proboscis of the insect are slowly withdrawn from their cases. At every contraction, a fluid is observed to fluctuate within the cavity of the chest. At length the head and anterior part of the body are entirely disengaged, and the animal hangs in the air, being suspended by the posterior part of the body, which is retained by the shell with a force just sufficient for that purpose. The advantage of the depending position chosen by the chrysalis, is here obvious; as the force of gravitation is thereby called in to aid the exertions of the insect to escape from its shell.

When the insect becomes suspended in the manner I have described, its situation appears hazardous, and the observer does not readily perceive by what means it will save itself from a fall when the abdomen shall be loosened from the shell. After hanging motionless for one or two minutes to recruit its

exhausted strength, the muscles of the thorax are again ca into action, and the head bent forward toward the bo while the legs are kept moving at the same time, ready grasp any object within their reach. The first attempt of t kind is apt to fail; but on the second or third effort the ani succeeds in catching hold of the head of its half deserted sh and then by pushing itself forwards it completes the proc and leaves the empty case still adhering firmly by its origi attachment. Thousands of the shells may be seen thus adh ing to the trees and fences in the locust season.

Being disengaged from the shell, the insect proceeds spread out its wings, which are folded up somewhat like old fashioned lady's fan, so as to occupy a very small compa The expansion begins at the joint, and extends gradually to tip of the wing. The mechanism by which the operation accomplished appears to depend on the forcing of air into air vessels of the wing. We know that the veins which mify through the wing of an insect, are so many tubes conta ing air, for the purpose of adding to their levity. A close spection of the wing of the locust as it is in the act of expa ing, shows that these tubes become inflated with air dur that process. But whether or not it be the sole cause of expansion, does not admit of positive demonstration, thoug am disposed to believe the affirmative. If my conjecture correct, it will apply equally to the expansion of the wings all soft winged insects.

When the locust first issues from its shell, it is nearly whi but soon after the wings are completely spread, it acqui very nearly the dark brown color which it afterwards wea The time required to accomplish its several operations, fro the splitting of the shell to the full extension of the wings, from half an hour to an hour.

I have said that the chrysales remain under ground, rea to rise, until the weather is suitable. This is a subject of t utmost importance to the insect. For if the air be cold, it benumbed and unable to disengage itself from the shell; and it should become dry, the shell grows so hard that the sam consequence ensues. In either case the result is fatal. T

ir must therefore be *warm* and *moist.* I have frequently rought the chrysales into the house in the evening, just after hey had risen from the ground, and placed them on my table o witness their operations. For a long time they crawled bout in an uneasy manner, evidently dissatisfied that their iovements had been interfered with. At length, after reeatedly rubbing their head and feelers with their feet, they ttached themselves to some object, and soon split their shell. Many of them, however, were unable to get out of the shell on ccount of its hardness. On one occasion, when I had procured about fifty of the chrysales, they were left for several hours imprisoned in a box before I had leisure to attend to hem. Of this number only three or four succeeded in escaping from their shell. Nearly all of the remainder split their shell, and after making considerable progress in the operation, were unable to go farther, and consequently died. I observed that all those which made much progress before their operations were checked by the hardness of their coverings, ruptured the hin transparent membrane on the back part of the thorax, making an orifice through which the fluid which fills the insect exuded. This fluid fell on the table in drops. On dissection, I found the cavity containing it to extend the whole length of the thorax and abdomen. The fluctuation which I remarked to be visible after the shell is split, is produced by the motion of this fluid.

By examining several of the insects soon after the shell began to split, I have ascertained that the rupture of the shell takes place before the limbs are started from their encasements.

It appears to be produced by the contraction of the muscles of the chest. These muscles are easily seen when the chest is laid open. They are in the form of small threads or fibres, composing the principal part of the thorax.

When the locust has become invigorated by several hours of exposure to the warm atmosphere or to the sun, it is ready for flight. Its powers of flying, however, are but feeble; it cannot fly far, nor remain long on the wing. In the course of a few days the male commences his song of love, which is performed by means of several membranes, which are concealed

under his wings, and between the thorax and abdomen. By gently pulling the abdomen to one side, they are exposed to view, in the form of thin, circular plates of a whitish color. Muscles are attached to them in such a manner that the insect can make them vibrate at pleasure, and produce his peculiar note. These membranes are designated in the engraving. As the female is not supplied with this sounding apparatus, she cannot make no noise.

Naturalists have concurred in admitting that the locust in its winged state takes no food. That it can eat nothing in one sense of the expression is evident from its construction; it has no jaws, but is furnished with a proboscis, or suctorious tube like the mosquito. A friend of mine, one very warm day during the present season, informed me that he had seen the insects in great numbers, sucking the juice from the apple trees in an orchard. But the statement was so contrary to all previous observation, that I hesitated to believe it, supposing my informant to have been in some manner deceived. On the same day, however, as I was riding in the country just before sunset, my attention was attracted by the sight of a large number of the insects on the trunks of some young trees by the roadside. Having alighted, I was at once surprised and gratified to find that their probosces were all inserted into the bark of the trees; while the ants crowded around eager to partake of the feast. One of the locusts I observed in the act of piercing the bark with his tube—for they were not at all shy, and appeared to take no notice of my approach. The individual alluded to inserted his proboscis gradually to the depth of the eighth of an inch, moving his body backwards and forwards while at work, much in the same manner that a man moves his hand while forcing the point of a pen-knife into a board. When not in use, the proboscis lies under the chest, and pressed so close to it, as to lead to the impression that it cannot be separated far from the body. But while feeding it is at right angles with the body.

They did not appear particular in the choice of trees for nourishment, as I found them on nearly all the young trees in the woods—the common hickory (*Juglans tomentosa,*) the

white oak (*Quercus alba,*) the persimon, (*Diospyrus Virginiana,*) and the sweet gum (*Liquidambar styraciflua.*) On the two latter they were most abundant. In a grove of persimons, from 20 to 40 were sucking at every tree. The first that I observed were males, but I afterwards found a considerable number of females, though not half as many as of the former. On the contrary, I have satisfied myself that generally speaking, there exist, or did exist the present year, about two females for one male, in the whole family of locusts.

In a week or ten days from their transformation to the winged state, the females begin to deposit their eggs. For this purpose they select the small branches of trees, generally the growth of the preceding year, and having stung them with their ovipositor, they insert the eggs into the wound. The injury to the twig is such as generally to kill it, when it is broken off by the wind and falls to the ground, carrying with it the eggs, or it may be the newly hatched progeny. The young locusts then enter the ground, and are seen no more for seventeen years.

Having already lengthened this essay beyond my expectation, I will defer the remaining part to the next number of the journal. Several interesting subjects remain to be examined, as the construction of the apparatus for depositing the eggs, the mechanism of that operation, the design accomplished by wounding the tree &c. The nature of the insect when it enters the ground, whether in the larva or chrysalis state, is a subject of dispute which I shall in all probability be able to determine in the subsequent portion of this essay.

PROCEEDINGS OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

MAY 20th, 1834.

Dr. S. G. MORTON having presented to the Academy a considerable number of zoological specimens, obtained from the West Indies during his recent voyage, made some observations on the natural history of some of these islands.

Among the incidents which first attracted his attention, was the remarkable paucity of mammiferous animals in all the islands north of Trinidad, and especially in Barbadoes; but three genera being there found; the racoon, two species of rats and the monkey. So similar was the racoon in every respect to our own,—PROCYON *lotor*,—a fact ascertained by a close inspection of one which had been caught, in which he could see no appreciable difference, that he was induced to believe it had been introduced from this continent many years ago. He was assured, however, by an intelligent gentleman, that this was not the case: for a law enacted nearly 200 years since, provided for the destruction of these animals, so numerous and noxious were they at that early period. The same statute included the monkies; but notwithstanding this effort to exterminate them, they still exist in considerable numbers.

The English settled this island in 1605, when according to Malte Brun, it was uninhabited and covered with forests. No root or herb they saw, that could be used for food; and the woods were so thick that they had great difficulty in clearing sufficient land to yield them subsistence by cultivating it. When these obstacles were surmounted, and the first inhabitants found that the soil was favorable for the growth of cotton, indigo and sugar, colonists flocked thither in great numbers; so that at the expiration of forty years after its original settlement, its population amounted to 50,000 whites and 100,000 negro and Indian slaves. But this flourishing condition continued but half a century; the number of its inhabitants decreased, and at this day they are less numerous than at the period alluded to. The island is twenty-one miles long and fourteen broad.

Dr. Morton also presented several Echini, (sea hedgehogs,) one of which, a very handsome and peculiar specimen, was new to him, not being in any of our cabinets. He directed the attention of the Academy to them, principally to instruct the members of the course he adopted from Mr. T. R. Peale, to preserve them with the spines in their natural position. These, it is known, generally fall when the animal dies, so that we seldom see a specimen in which the spines retain the same position as they did in the living animal. To avoid this difficulty, he resorted to the process of immersing the animals in a solution of corrosive sublimate in diluted spirits of wine. The result was as anticipated; for the spines retained their natural erect position and did not relax, owing to the permanent contraction of the muscular fibres that attach them to the body; so that this process of preparation may be recommended as the best in practice.

In two species of Ophiura, (starfish,) the faculty of reproduction was exhibited in a very remarkable manner. These animals are to be found in great numbers under rocks on the sea shore of the island of Barbadoes. If caught by one of their rays, they instantly disengage themselves from it, at the distance of an inch or less from their body, and retreat in possession of the remainder toward the water. By way of ascertaining how far they could exercise this faculty,—though it may be thought a cruel experiment,—he took hold of another ray, which was in like manner disengaged. It parted with the third and fourth successively in the same way; and ultimately, when the fifth and last was taken hold of, it separated itself from it also, and endeavored to escape to the sea with its dismembered body.

The Doctor also stated that he had obtained in Barbadoes a single species of Clausilia, the first which has been found in the western hemisphere. These he had shown to Dr. Cutting of that island, a very intelligent conchologist, who informed him that he not only had never found it himself, but had not heard of it existing this side of Europe.

He presented to the Academy a specimen of the Rana, [illegible]s i
Crapaud of Dominica, which is much used as an article [illegible]med
food among the Creoles. Great care is taken to propaga[illegible]ng
them in ponds made for the purpose. Notwithstanding the [illegible]ger
inclination he had always felt to feasting on these animals [illegible]ploy
home, he could truly say that he never enjoyed a more delica[illegible]cco
and palatable dish, than that which was made from their hi[illegible]ded
legs, and placed on the dinner table at the hotel. The epicu[illegible] Vir
has done well in introducing frogs to the attention of his kitch[illegible] the
queen. The specimen he presented, which was seven inch[illegible]sses
in length of body, and which he was assured was not mo[illegible]ched
than half the size of the largest of them, had been prepared [illegible]rne
a negro slave, who had taken up the employment without a[illegible]rry
instruction whatever, and had so well succeeded as to produ[illegible]oduc
surprisingly beautiful preparations; Dr. M. presumed it mu[illegible] Dr.
have been stuffed from the mouth, as no incision could be o[illegible]is ve
served in any part of the body. [illegible]n the
[illegible]ained

After this, the Doctor called the attention of the meeting to [illegible]
collection of forty Peruvian skulls, which he now deposited i[illegible]
the Academy. They were obtained at Pachacamac, or th[illegible]
temple of the sun, near Lima in Peru, by Dr. Ruschenberge[illegible] PLA
of the United States' navy. These had been brought at the in[illegible]
stigation of Dr. Morton, who was desirous of ascertainin[illegible] Th
whether the flatness of the occiput, or back part of the cra[illegible] *Hu*
nium, which was so remarkable in several specimens of hi[illegible]ed a
collection, and to which he had frequently directed the atte[illegible] *Lu*
tion of the Academy, was natural or artificial. For this pur[illegible]ema
pose he was desirous of obtaining a large number, so that a[illegible]eldo
accurate judgment could be derived from them. *L*

The locality from whence these were procured, was of ver[illegible]een
ancient date. It may fairly be presumed that no depositions[illegible] *X*
have been made in this cemetery since the conquest of the[illegible] Lon
country by the Spaniards, a period of 300 years back, when[illegible] *E*
they so successfully endeavored to overthrow the religion and[illegible]ker
the religious ceremonies of the aborigines. Yet in all the[illegible] *A*
specimens referred to, this same flatness occurred, and in some[illegible]lore

s in a very remarkable manner; sometimes it commences mediately behind the ear, and extends half way round, thus ng the head a lopsided shape. It is the opinion of Dr. Ruschen- ger that this flatness is congenital, as no artificial means are ployed among the native races at present, to mould the head ccord with particular models of beauty or decoration. He ded to the practice of carrying burdens by the negroes of Vincent, who are remarkable for their low, flat foreheads, he probable cause of this peculiarity among them. A band ses across the forehead over each shoulder, to which is at- ched their load, which is of great weight. But it is to be ne in mind that close observation of the negroes who always rry burdens in this manner, gave no reason to suppose it oduced any change in the form of their cranium.

Dr. Morton concluded by intimating that he should continue verbal communications to the Academy from time to time, the objects of natural history now in his possession, and ob- ined during his sojourn in the islands.

PLANTS OBSERVED ON AN EXCURSION TO QUAKER BRIDGE, May, 1834.

Those only are enumerated which were in flower.

Hudsonia ericoides. In profusion; the first specimens occur- ed about six miles beyond Haddonfield.

Lupinus perennis. Several varieties in profusion. It was markable that this and the preceding plant alternated, being eldom found together.

Leiophyllum buxifolium. Common about Quaker bridge, first en about fifteen miles from Philadelphia.

Xerophyllum setifolium. Rare; but one specimen seen near ngcoming.

Eriocaulon decangulare? Common in ditches. Atsion. Qua- r bridge.

Antirrhinum canadense. Common; a variety with rose co- red flowers near the house at Quaker bridge.

Diapensia barbulata. Common; injured by the late fr

Arenaria squarrosa. Common; do.

Utricularia setacea. Quaker bridge; only one specime flower.

Arethusa bulbosa. Common.

Sarracenia purpurea. Do.

Andromeda racemosa. Do.

Cynthia. N. S.? This may prove one of the varieties o *Virginica*, but presents many differential characters.

Orontium aquaticum. Common; a variety with very nar leaves also occurred, but rare.

Uvularia sessilifolia. Rare.

Myrica cerifera. Common.

Viola lanceolata. This was the only species observed a passing Atsion.

Drosera rotundifolia, *longifolia* and *filiformis*, occur in pl around Quaker bridge, but were not yet in flower.

LAST MOMENTS OF CUVIER.

No part of a man's life is fraught with more thrilling i rest, than his closing scene. And that of him who has d so much for science as Baron Cuvier, cannot fail being of versal interest. The extract below is taken from Mrs. L Memoirs of his life; a work which should be in every libra

In the evening of May 8th, 1832, M. Cuvier felt some p and numbness in his right arm, which was supposed to proc from rheumatism. On Wednesday, the 9th, he presided o the committee of the Interior with his wonted activity. dinner, that day, he felt some difficulty in swallowing, and numbness of his arm increased. Never can the look and inquiry he directed to his nephew, when he found that br would not pass down his throat, be forgotten; nor the self-p session with which he said, as he sent his plate to Mada Cuvier, "Then I must eat more soup," in order to quiet alarm visible on the countenances of those present. M. F

éric, the younger, sought medical advice; and an application f leeches was made during the night, without producing any nelioration. The next day (Thursday) both arms were eized, and the paralysis of the pharynx was complete. He vas then bled, but without any benefit, and from that moment ıe seemed to be perfectly aware of what was to follow. He vith the most perfect calmness, ordered his will to be made; ınd in it evinced the tenderest solicitude for those whose cares ınd affection had embellished his life, and for those who had nost aided him in his scientific labors. He could not sign it ıimself, but four witnesses attested the deed. He sent for that good M. Royer, who was so soon to follow him, to make a statement of the sums he had expended, out of his private fortune, on the alterations of the rooms behind his house, though the affliction of this Chef du Bureau d'Administration was so heavy as almost to disable him from doing his duty. M. Cuvier alone was tranquil; and perfectly convinced that all human resource was in vain, he yet, for the sake of the beloved objects which encircled him, submitted without impatience to every remedy that was suggested. The malady augmented during the night, and the most celebrated medical practitioners were called in: emetics were administered by means of a tube, but, like all other endeavors, they did not cause the least alteration. Friday was passed in various, but hopeless attempts to mitigate the evil; and perhaps they only increased the sufferings of the patient. In the evening the paralysis attacked the legs; the night was restless and painful; the speech became affected, though it was perfectly to be understood. He pointed out the seat of his disorder, observing to those who could comprehend him, "Ce sont les nerfs de la volonté qui sont malades;"* alluding to the late beautiful discoveries of Sir Charles Bell and Scarpa, on the double system of spinal nerves:† he clearly and precisely indicated the changes of position which the parts of the limbs yet unpa-

* "The nerves of the will are sick."

† A month before his illness, he had read a paper at the Institute, upon a memoir of Scarpa's, on this distinction between the nerves of will, and those of sensibility.

ralyzed rendered desirable; and he was moved from his o in-l simple and comparatively small bed-room, into that sal love where he had been the life and soul of the learned world; a mo though his speech was less fluent, he conversed with his phy med cians, his family and the friends who aided them in their a out nizing cares. Among other anxious inquirers came M. P T quier, whom he had seen on the memorable Tuesday; and bea said to him, "Behold a very different person to the man wa Tuesday—of Saturday. Nevertheless, I had great things s for to do. All was ready in my head: after thirty years of lab cou and research; there remained but to write; and now the han dea fail, and carry with them the head." M. Pasquier, almost t tur much distressed to speak, attempted to express the inter mu universally felt for him; to which M. Cuvier replied, "I h effo to think so; I have long labored to render myself worthy it." In the evening, fever showed itself and continued night, which produced great restlessness and desire for chan of posture; the bronchiæ then became affected, and it w feared that the lungs would soon follow. On Sunday mor ing the fever disappeared for a short time; consequently E slept; but said, on waking, that his dreams had been incoh rent and agitated, and that he felt his head would soon disordered. At two o'clock in the day, the accelerated res he ration, proved that only a part of the lungs was in actio in and the physicians willing to try every thing, proposed to ca w terize the vertebræ of the neck: the question, Had he a right de die? rendered him obedient to their wishes; but he was spar ha this bodily torture, and leeches and cupping were all to whi they had recource. During the application of the former, Cuvier observed with the greatest simplicity that it was he w a had discovered that leeches possess red blood, alluding to o da of his Memoirs writen in Normandy. "The consummate ma ha ter spoke of science for the last time, by recalling one of t he first steps of the young naturalist." He had predicted th ti the last cupping would hasten his departure; and when rais tu from the posture necessary for this operation, he asked for e glass of lemonade, with which to moisten his mouth. Aft n this attempt at refreshment, he gave the rest to his daughte t

in-law to drink, saying it was very delightful to see those he loved still able to swallow. His respiration became more and more rapid; he raised his head, and then letting it fall as if in meditation, he resigned his great soul to its Creator without a struggle.

Those who entered afterwards, would have thought that the beautiful old man, seated in the arm chair, by the fire-place was asleep, and would have walked softly across the room for fear of disturbing him; so little did that calm and noble countenance, that peaceful and benevolent mouth, indicate that death had laid his icy hand upon them, but they had only to turn to the despairing looks, the heart-rending grief, or the mute anguish of those around, to be convinced that all human efforts are unavailing when Heaven recalls its own.

SCIENTIFIC MEMORANDA.

Extract of a letter from R. C. Taylor, to R. Harlan, M. D. of this city, dated

Lycoming Valley, 15th May, 1834.

"I have two good specimens of scalops in a whiskey bottle here for you. I thought it was Sorex *brevicauda*, from the incisors. I am surprised at the number of these little animals which I see dead in my daily walks; I cannot make out the destroyer. Some tell me it is a martin or wild cat. Those I have found since the two first are unmutilated.

I have a little history of one of the sable gentry, which I will just tell you, because it may afford some clue to elucidate a circumstance, of which, at any rate, I am in doubt. Yesterday morning one of our miners told me, that in a hole that he had dug a day or two before, in search of coal, fourteen deep, he noticed the preceding evening a deer *mouse*, (our most beautiful Alleghany species,) and our friend the scalops had unfortunately tumbled together. They were of course unable to escape, but were both alive and well. I went up with the miner next morning to secure both species for you, but I found them both dead. The mouse had killed the mole, and had de-

voured the flesh of the hinder legs and parts. Now it appeare to me that the mouse was constrained by hunger to eat of description of food new and injurious to him; for he appeare killed by it, being blown up into a round ball, as if ready burst. This, therefore, seemed to account for the circumstanc that all the other animals reject the scalops for food after the have killed him. I tell you my own reasonings, however, de rived from the accidental rencontre of the mouse and the mo at the bottom of a coal pit.

Origin of the word halcyon.—Many of the most familia words in the English language are derived from sources whic few readers would suspect. The mythology of the ancien supplies a large number. Thus the word *halcyon* comes fro *Alcyone* or *Halcyone*, a fabled queen of Thessaly, who threw herself into the sea on hearing of the death of her husband. I consequence of this commendable exploit she was transforme into the bird called the Halcyon—a process anciently much i vogue to immortalize very good or very bad people. Thi bird, which is a kingfisher, was fabled to make her nest an brood over her young on the water, and thus to keep the water calm. Hence the word *halcyon* came to be applied as an ad jective, expressive of calm, or undisturbed tranquility.

Fetid springs in Asia Minor.—At the base of Mount Taphi assus in Ætolia, are several springs of fetid water. Accord ing to the ancients, the odor of the water was caused by th body of Nessus who died there. The modern name of th mountain is Kakiscala. The peculiar property of the water i doubtless owing to the mineral substances which it holds in so lution—probably sulphuretted hydrogen, or some compound o sulphur.

Supposed preservation of life from the effects of lightning, by a silk handkerchief.—The papers give an account of a young lady who was struck dead by lightning in Lynchburg, Va. while in the act of lowering a window sash during a shower. Her sister who was in the same room was knocked down by

the shock, but recovered. The account states, that "the doctors" supposed the life of the latter to have been preserved by a silk handkerchief which covered her shoulders! We are at a loss to comprehend this notion. Whoever has tried the experiment, knows that one or two folds of a silk handkerchief offer no appreciable impediment to the passage of the electric spark from the prime conductor of the machine, or from the Leyden bottle. Had the stroke of lightning avoided the body and entered some other object contiguous, there might be some cause for believing that the handkerchief had an effect in diminishing the attractive power of the person, and thus giving the fluid a different direction. But we have doubts whether a silk handkerchief thrown over the shoulders could have such an effect under any circumstances; and we would as soon believe that a man's clothing could be rendered incombustible by a policy of insurance contained in his pocket, as that a silk garment could save his life from the effects of a stroke of lightning which entered his body.

Mode of teaching brutes to dance.—In the "Penny Magazine," an account is given of the method by which bears and cocks are sometimes taught to dance by wandering Italians. They took a large earthen pan, or something similar, and placed it over a small fire. The wings of the feathered pupil were then clipped or tied down, and his feet and spurs each wrapt up in a piece of cloth; when he was stood in the pan and the fire kindled beneath. As chanticleer began to feel the heat under his feet, he very reasonably began to lift them up alternately, which he did quicker and quicker as the heat increased. All the while, one of his preceptors played a lively tune on some instrument, and another blew the fire. A few lessons of this sort taught the cock to dance whenever the music was played by his keeper, without waiting for the application of the fire to his feet. Bears were taught the highly intellectual accomplishment in a similar manner. Our clumsy candidate for the honors of fashionable life, had his hinder feet clad in a sort of shoe, or dancing slipper, while his fore feet were left naked. The consequence was, that when bruin was

walked upon the griddle, his fore paws or hands, becoming uncomfortably warm, he stood up like a man; and presently, as the heat penetrated his pumps, he began to lift up his feet, one at a time of course, and hold them in the air to cool. Thus, by the time the griddle became quite hot, the savage animal was in a lively dance, apparently keeping time with the music.

Sparks in the freezing of water by ether.—Pantus, professor of chemistry at Calais, has observed, that if the freezing of water is performed in a small glass bottle, terminating in a thin neck of ½ cent. in length, round which some cotton, moistened with ether is wrapped, and if the atmospheric air be removed from it by the well known method, *clear visible sparks* may, by daylight, be discovered disengaging themselves from the neck, just a few moments before the freezing takes place. This phenomenon appears to be a steady and a sure guide for indicating whether the freezing will soon take place or not at all.—*Translated by Dr. Lewis Flenchtwanger, from the Central Blatt, July*, 1833. *Silliman's Journ.*

NOTICES OF WORKS IN THE PRESS.

"Synopsis of the Organic Remains of the U. States. By *S. G. Morton.*" We are happy to announce that this valuable work is nearly ready for publication. The author's zeal and industry has added greatly to our knowledge of American Geology. This work will be illustrated by nineteen plates, and very numerous figures of fossils, many of which were obtained at considerable labor and expense in very remote localities.

"Transactions of the Geological Society of Pennsylvania." This valuable Journal has commenced auspiciously; as it contains very important geological essays, particularly a general view of all the organic remains of this country hitherto published or described; this interesting paper is by Dr. Harlan, whose labors will be fully appreciated by Geologists in this country, and in Europe. We hope to be able to give a more extensive notice of the work in our next number.